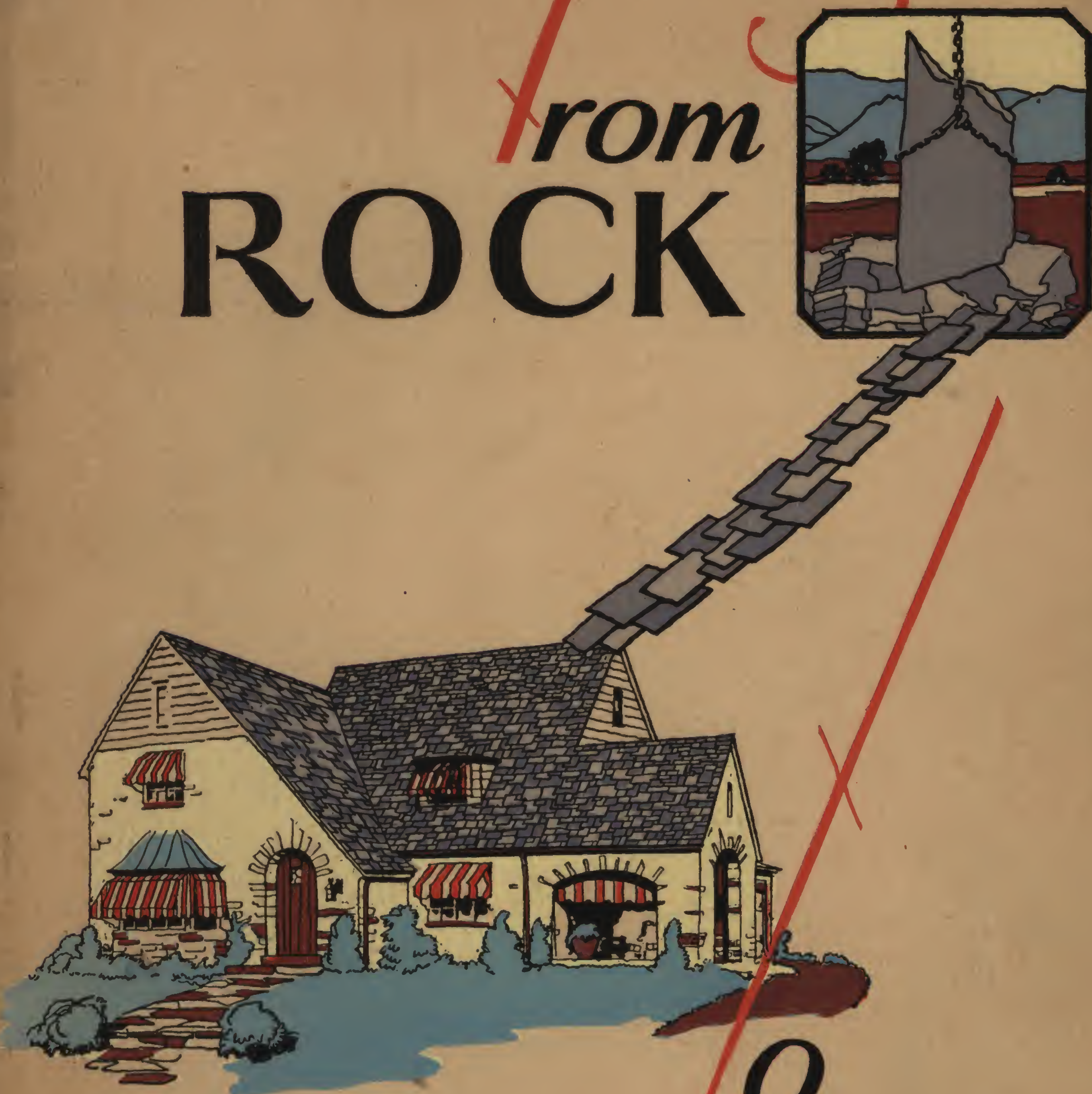
from ROCK to ROOF



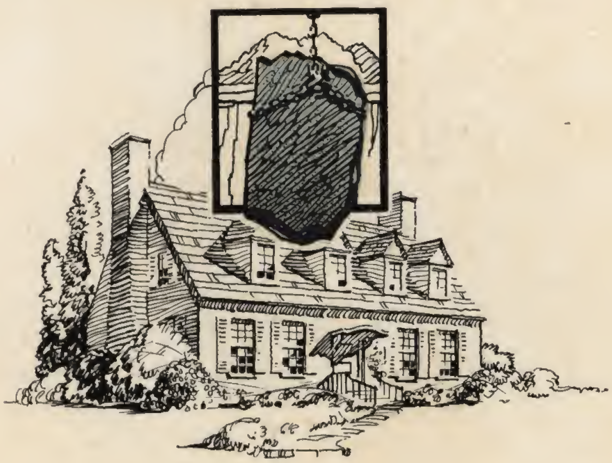
WHAT YOU NEED TO KNOW ABOUT SLATE

Pennsylvania Slate Institute

Member Quarries

ALBION VEIN SLATE COMPANY, PEN ARGYL, PA.
CHAPMAN SLATE COMPANY, BETHLEHEM, PA.
COLONIAL SLATE COMPANY, PEN ARGYL, PA.
DONEY SLATE COMPANY, PEN ARGYL, PA.
JACKSON-BANGOR SLATE CO., PEN ARGYL, PA.
PARSONS BROS. SLATE CO., PEN ARGYL, PA.
BLUE RIDGE QUARRIES, SLATINGTON, PA.
VENDOR SLATE COMPANY, EASTON, PA.
AMALGAMATED SLATE CO., EASTON, PA.

from ROCK *to* ROOF



The story of how natural rock is fashioned by hand into the most durable and distinguished of roofings.

SLATE formed by Nature fashioned by hand to protect man's finest possession—his home.

Published by

PENNSYLVANIA SLATE INSTITUTE

PEN ARGYL, PENNA.

The QUARRY "ELEVATOR"

The "boxes" in which the men go down into the Quarries may be a bit too open and airy to suit most of us, but they are strong and safe none the less—and necessary!

For many of the Pennsylvania Slate Quarries are 500 to 800 feet deep—deep enough to bury the Woolworth building. "Deep slate is good slate."

The AGE - OLD CHARM OF HAND CRAFTSMANSHIP

THERE is one thing machinery cannot produce: it cannot produce the charm of hand craftsmanship.

The ever increasing volume, precision and uniformity of machine-made merchandise is creating a growing hunger for the individuality of things *handmade*.

You see this hunger everywhere. The vogue for Antique furniture is just one phase of this hunger. Modern factory-made furniture may be as artistically designed, as well made and more comfortable than any antique. So when hard-headed business men vie with each other to pay fancy prices for an "Antique" it's the charm of hand craftsmanship they are buying. There is no vogue for collecting second-hand factory-made furniture.

Modern machinery can produce rugs and carpets quite as wear-resisting as the hand work of the "Oriental." It can reproduce accurately the design and coloring of the Oriental. The one thing it cannot reproduce is their delightful "hand made" irregularity.

"Burned Brick," the knotty, discolored, mis-shapen bricks from next the fire in the kiln which once were thrown away or sold for a song, today bring a better price than perfect brick. "Burned" brick can hardly be called a hand made product; it does, however, carry those irregularities of shape and color that are the charm of Nature and of natural products.

SLATE—*the only Natural Hand-Made Roofing*

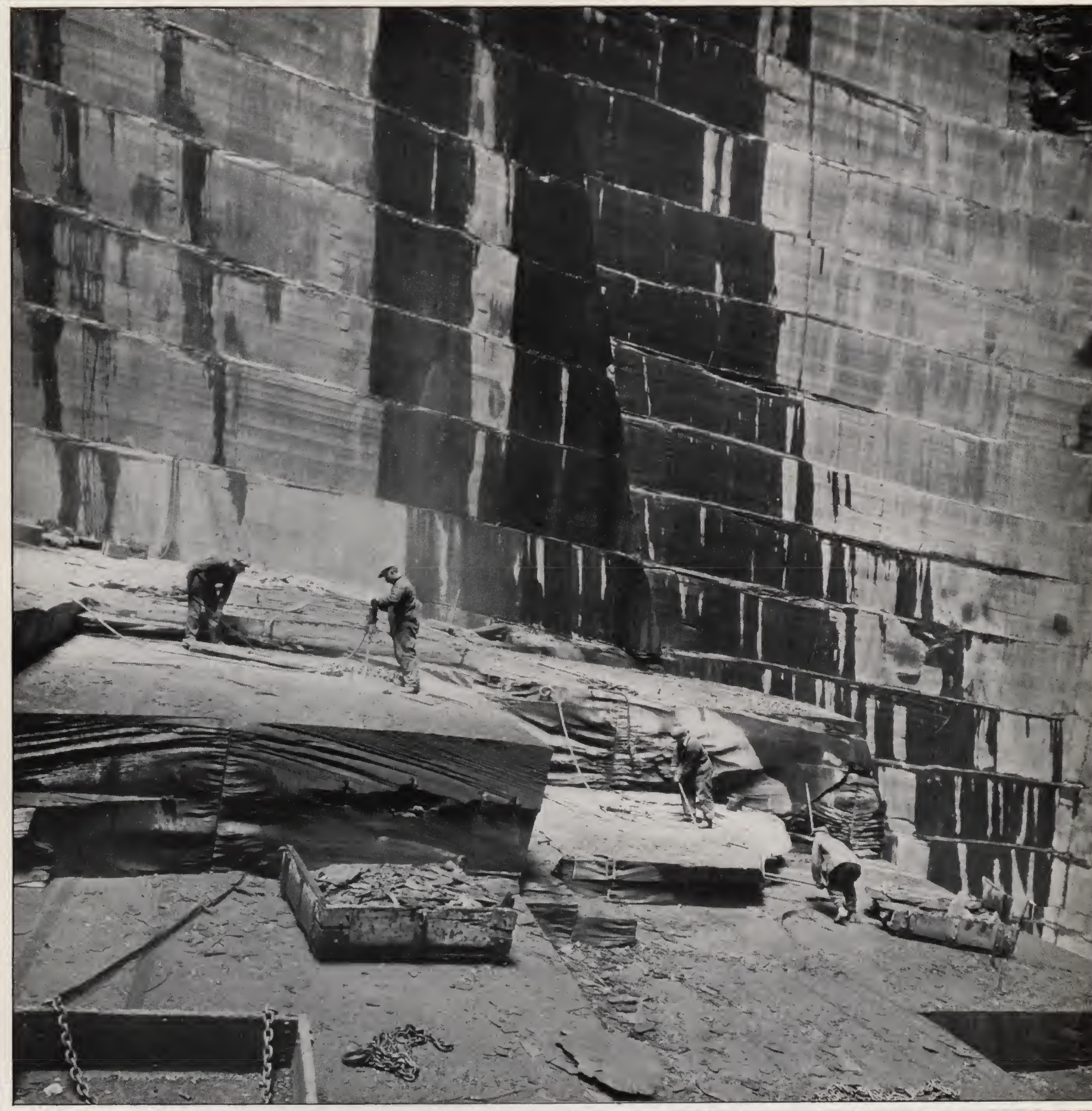
WHEN roofing slate first came into use in this country, it was chosen for its practical qualities, its ability to withstand blistering sun, blustering wind, driving sleet as could no other roofing. Today its increasing use is based fully as much on its artistic qualities as on its practical merit.

Slate is a natural product, hand fashioned. Two slate shingles can no more be exactly alike in texture or color than can two leaves from the same tree or two roses from the same stem.

Therein lies its charm. In this day of machine-made products, of metal window casements, factory made tile, and even steel skyscraper construction adapted to house building, a slate roof with its air of hand craftsmanship has become the distinctive, even the "distinguished" feature of the home.

And yet to cover a house with almost imperishable Pennsylvania Blue-Grey Slate will cost less than it costs to cover its floors with perishable rugs and carpets.

A house cannot change its roof daily, weekly, monthly as you change your clothes. Choose a roofing that will never grow tiresome—PENNSYLVANIA BLUE-GREY ROOFING SLATE.



ONCE *an* OCEAN BED—NOW *the* QUARRY FLOOR

Slate, according to geologists, is sediment deposited on the ocean floor and afterwards compressed and hardened under tremendous pressure, and altered into compact, fine-grained rock. An idea of the earth pressures involved is gained from the fact of their having been sufficient to raise the ocean bed to a height of 500 to 1,000 feet above sea level.

The photograph shows the quarrymen cutting the slate rock into giant blocks. Note the clean split and cleavage of the rock.

WHAT DOES IT COST

IF we had to manufacture slate rock in a factory or laboratory the cost of a slate roof would be more than that of the rest of the building.

But Nature has done this costly work for us. With tremendous heat and pressure she has metamorphosed an aquas sediment into the finest natural roofing known to man.

When you buy roofing slate less than ten cents out of each dollar of cost goes to pay for the slate rock: the big percentage of the cost is represented by labor—hand craftsmanship—the work of quarrying, splitting and dressing the slate by hand.

In the manufacture of artificial roofing, it is different. The material itself must be fabricated; there is no margin for hand craftsmanship; costs must be cut by handling every possible operation by mass production methods. That is why Pennsylvania Blue-Grey Slate, made from natural rock and fashioned by hand compares favorably in price with fabricated roofings that give only a fraction of its years of weather-proof service.

There are today, three types of roofing—temporary roofings, semi-permanent roofings, and permanent roofings.

By temporary roofings, we mean materials that cannot be expected to give more than a dozen years of weather-proof service and will look shabby and be leaky in half that time.

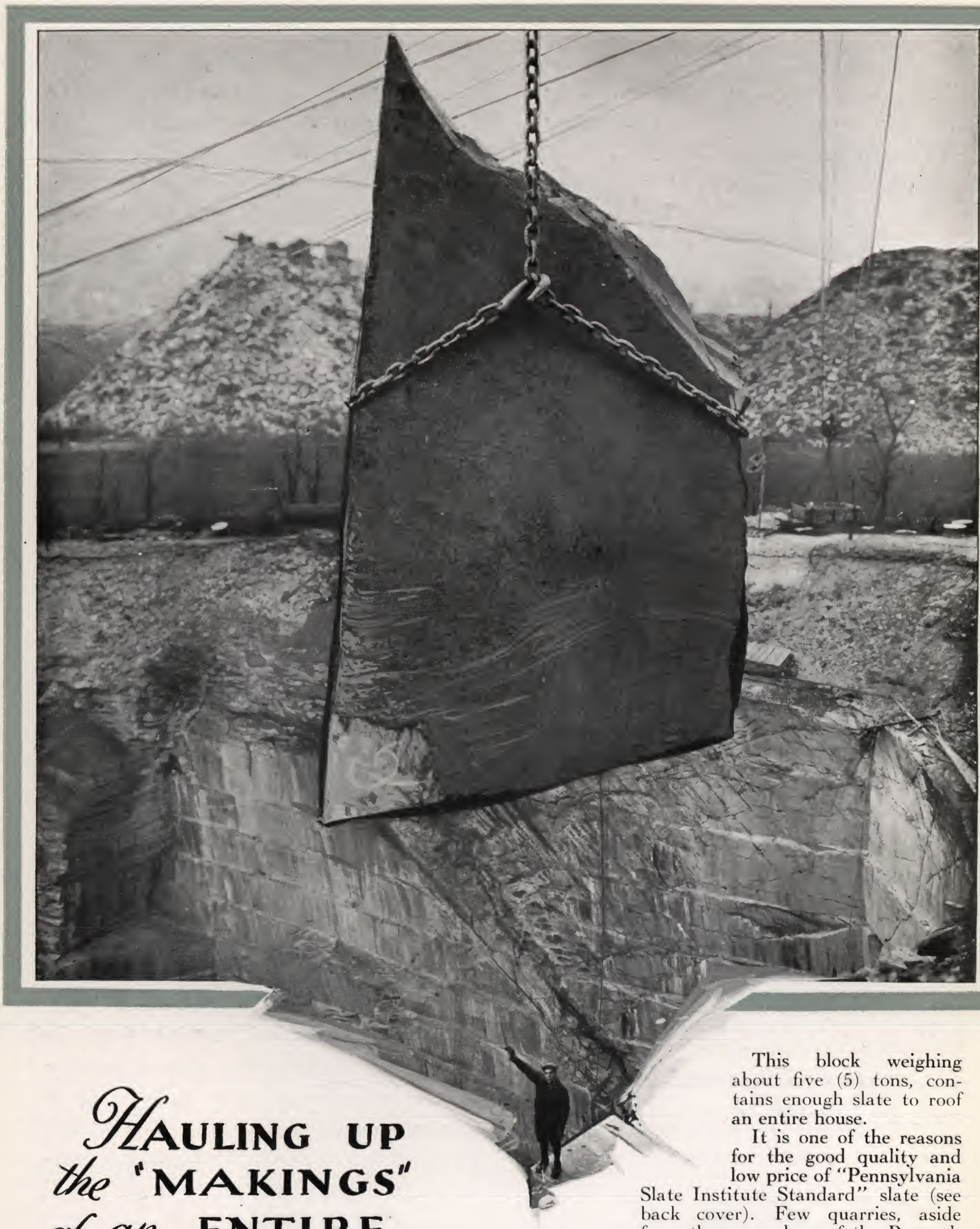
In comparison with such temporary roofings, Pennsylvania Blue-Grey Slate is naturally a little higher in cost. But the difference is much less than is generally understood. It is doubtful whether the cost of a Pennsylvania slate roof over the cheapest of substitute materials will add even one per cent to the cost of the finished structure.

Where strict economy is necessary there are many better places than the roof to save that amount. The damage done by a single storm to the walls, ceilings and decorations of a poorly roofed building may easily exceed not only the extra cost of Pennsylvania slate, but its *entire cost.*

By semi-permanent roofings we mean the factory-made imitations of natural rock and slate. Usually these roofings are made of cement or clay with sometimes the addition of a small per cent of asbestos or other materials.

Such roofings have four main faults. They have a modulus of rupture (intrinsic strength) much lower than slate; a porosity (faculty of absorbing water) 20 to 100 times greater than slate, often absorbing enough water in a severe storm to increase their

Nature keeps her warm colored flowers near the ground. Perhaps that is why the adage "warm colors in the walls, cool colors in the roof" is a building axiom which never disappoints.



Hauling UP *the* "MAKINGS" *of an* ENTIRE ROOF *or* TWO

This block weighing about five (5) tons, contains enough slate to roof an entire house.

It is one of the reasons for the good quality and low price of "Pennsylvania Slate Institute Standard" slate (see back cover). Few quarries, aside from those members of the Pennsylvania Slate Institute, have the quality of rock or cleavage to make possible the handling of such enormous blocks.

original weight 20 to 40%; they have artificial colorings which cannot stand the rigors of the summer sun and winter storms; finally—perhaps mainly—they carry with them that regularity which is ever and everywhere the stamp of the artificial, factory-made product.

And yet slate is actually cheaper than most semi-permanent roofings.

(One word of caution, however. To make these roofings seem cheap they are often quoted in hexagonal or horizontal lay instead of American lay (See pages 24 and 25). In comparing prices be sure similar lay is designated for all roofings considered.)

Compared with other slates, the roofing slate produced by the members of the Pennsylvania Slate Institute represents the biggest dollar's worth of value. The formation of the rock and quality of cleavage in these quarries makes it possible to handle great blocks of slate. Often a single block will contain enough slate to roof an entire house. This means economical production.

One thing more—the Pennsylvania Slate Institute insists that the slate sold by its members shall have a modulus of rupture of at least 7,000 lbs. per sq. in., a porosity of less than ½ of one per cent., a thickness to average 22″ go 24″ to the hundred slates. And, for your protection, it issues a Certificate Guarantee with all slate made by its members. Ask your architect, roofer, or builder to furnish you with this Certificate.

THE old covered bridge at Bethlehem whose Pennsylvania Blue Gray slate roof withstood the constant vibration of vehicular traffic, the driving storms of Winter and the cyclonic winds of Fall and Spring until the old bridge was recently replaced with a more modern structure.

Slate is natural rock, hand fashioned—the one roofing that carries the distinction and charm of hand-craftsmanship.

Making BLOCKS *for the* SPLITTERS *First Stage*

Once on the "banks" the great slabs of slate are turned over to the Block Makers who split them into convenient lengths, with the aid of compressed air drills (one of the few mechanical aids of the slate worker) and iron wedges.

Making BLOCKS *for the* SPLITTERS *Second Stage*

These lengths are in turn sculped (split with the grain) into the proper widths. This again, as the photographs show, is hand work.

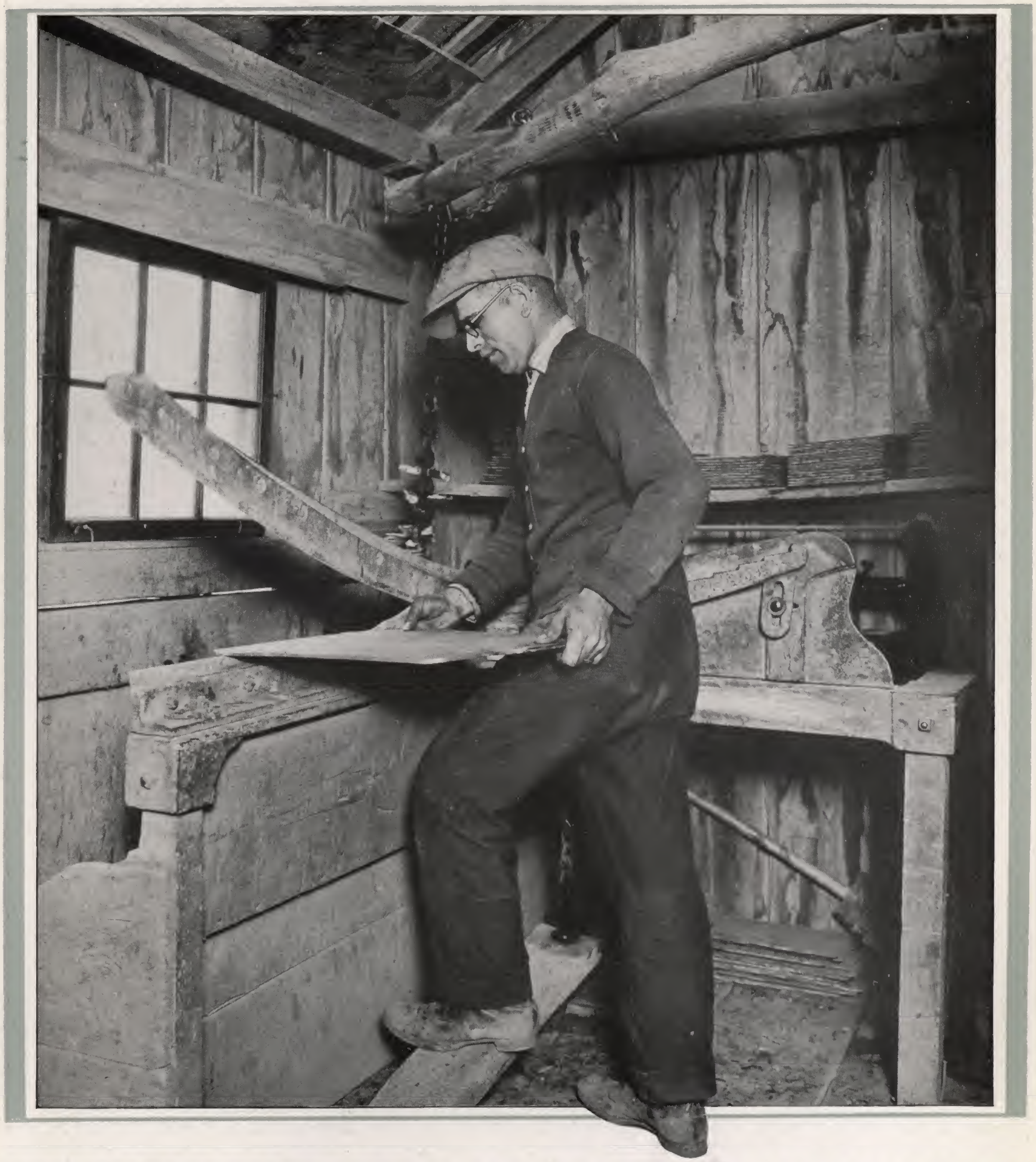
Rock that SPLITS BETTER *than the finest* WOOD

The work of the splitter is hand craftsmanship. With only the help of the mallet and chisel, he splits the blocks into slate of the desired thickness.

When blocks are small and cleavage good, a single chisel will produce a clean split.

For larger blocks or more stubborn cleavage, a second chisel is sometimes introduced.

Note the can in the background. It contains water and a swab stick to wet the slate, for from quarry to dresser the slate blocks must be kept wet to keep them fresh.



HAND DRESSING SLATE WITH GIANT SCISSORS

The final process in making roofing slate is hand dressing it to the proper sizes. The slate dresser's aid is a pair of giant scissors worked by foot power, leaving his hands free to guide the slabs of slate. The result is a rugged edge with that touch of irregularity which is the age-old charm of the hand-made product and the despair of machine reproduction.

SELECTING THE ROOF WHICH FITS THE HOUSE

FROM an artistic standpoint there are two factors which govern the selection of a roof.

The materials of which the house is constructed govern the color of the roof; its architectural features, the type of roof.

For example, a brick house at once suggests the use of a blue-grey slate roof. With so much color in the walls of the house to add more color in the roof is to kill the effect by lack of contrast for as Bogoslovsky says, "All our cognitive experience is based on contrast."

From an Architectural standpoint, roofing treatments divide into two classes, rugged irregular lays for informal types such as the English and Norman, and conservative, regular treatments to complement the more formal lines of Colonial and kindred architecture.

"A picture" says a Chinese proverb "is worth a thousand words." On the following pages we illustrate the leading types of modern architecture with roofs that fit.

One word more—Today there is little so-called "pure" architecture. Most homes combine the attractive features of several architectures. The designations used with the following pictures are taken from the dominating feature of the house.

THE Colonial house reflects the strength and dignity of the American Colonists. The cool, strong tones of Pennsylvania Blue-Grey slate in uniform or random widths provide a roof in complete harmony with the Colonial spirit. See Pennsylvania Slate Institute (P. S. I.) Specification No. 31-A, or 31-B, or 32-B, pages 29 and 30.

"NORMANDY COTTAGE" architecture calls for a slate roof. The stucco walls of this particularly pleasing example suggest Blue-Grey slate for contrast and depth of color. But so adaptable is slate that even here the builder has several choices. Either butt cut or offset dressed slate would have been equally appropriate and could have been given either standard lay or a random lay, or a thatched lay. See Pennsylvania Slate Institute (P. S. I.) Specifications 31-B, 32-C, or 11-D—pages 30, 31 and 27.

MUCH of the character of this modern cottage is contributed by its rugged Blue-Grey slate roof. Offset dressing and a slight open spacing of the slate contributes to the rugged effect. See Pennsylvania Slate Institute (P. S. I.) Specification 31-A-2.

FOR the English or Norman house, tradition calls for a slate roof—preferably a somewhat rugged and irregular slate roof. Pennsylvania "VARITONE" slate in offset dress provides a rugged roof in harmony with the spirit of such architecture and is particularly charming in the thatched lay. See Pennsylvania Slate Institute (P. S. I.) Specifications 11-D, 32-C, or 11-B, pages 27, 31, 26.

THAT a gasoline station need not be a red-roofed "Spanish" monstrosity is demonstrated by this charming little station of stucco and slate. With the rough stucco and the suggestion of English architecture, a more rugged roof might have been even more attractive. See Pennsylvania Slate Institute (P. S. I.) Specification 11-B or 11-D, pages 26 and 27.

THAT every good rule is entitled to one exception is exemplified by this quaint "Virginia Farm House." Brick walls ordinarily call for a roof of uniform Blue-Grey slate such as Pennsylvania Slate Institute (P. S. I.) Specification 31-A, or 31-B-1. But here where the walls are so ivy-grown as almost to be obscured, Pennsylvania Varitone either butt cut or offset dressed makes a permanently delightful roof. See Pennsylvania Slate Institute (P. S. I.) Specifications 11-A, 11-B, or D-11 see pages 26 and 27.

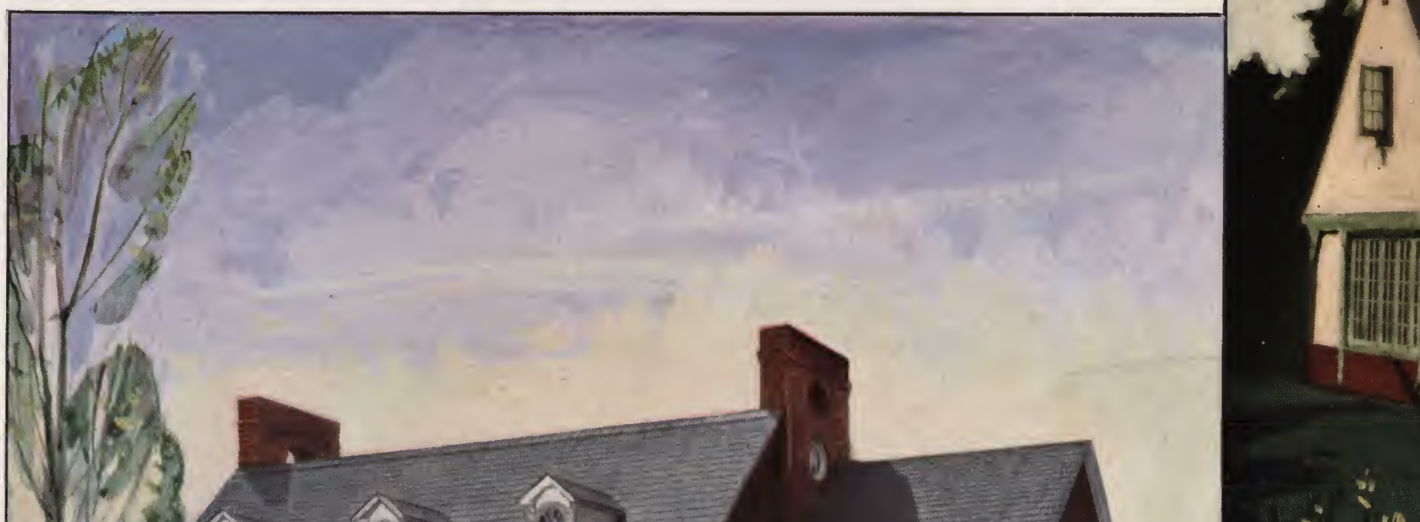
CHARACTERISTIC of the New England Village house is the Combination of a brick main building and a clapboard wing. Notice how harmoniously the Pennsylvania Blue-Grey slate roof suits each type of construction. See Pennsylvania Slate Institute (P. S. I.) Specification 32-B or 31-A, pages 30 and 29.

WHERE dignity and strength are the dominant architectural characteristics of a building, those same characteristics should be reflected in the roof, as in the strong cool tones of the Pennsylvania Blue-Grey Slate roof of this splendid example of New England Colonial architecture. See Pennsylvania Slate Institute (P. S. I.) Specification 31-A or 32-B, pages 29 and 30.

IN selecting a roof for this New England farm house, two courses were open—either to harmonize with the clapboard second story by using Pennsylvania Blue-Grey butt cut slate in uniform lay, or to harmonize with the field stone construction by selecting a rugged Blue-Grey slate in offset dress. See Pennsylvania Slate Institute (P. S. I.) Specifications 32-B or 31-B-1, pages 30 and 29.

"Warm Colors in the Walls Cool Colors in the Roof"

THE natural affinity between brick and slate is ideally demonstrated in this interesting colonial residence. The beauty of the warm colors of the brick walls is emphasized by the cool, strong tones of the Pennsylvania Blue-Grey slate roof. While the even lines of the brick suggest the standard lay in either uniform or random widths, the roof might here been even more attractive if the slate had been offset dressed to give it a heavier effect and to emphasize its "hand made" qualities. See Pennsylvania Slate Institute (P. S. I.) Specifications 32-B, 31-B, and 31-A, pages 30 and 29.



Modern Architecture Recognizes the Charm of the Slate Roof

MUCH of the charm of this "Irish Cottage" lies in the long, sweeping lines of its rugged Blue-Grey slate roof. Notice again that the truth of the law that beauty lies in contrasts is demonstrated by the harmony between the light stucco of the facade and the strong Blue-Grey of the roof. For such buildings Pennsylvania Slate Institute (P. S. I.) Specifications 32-C, 11-D, or 31-B, pages 31, 27 and 30 should be considered and offset dressing and rugged slate specified.

THE versatile quality of Pennsylvania Blue-Grey Slate could nowhere be better illustrated than in this charming old ivy-grown church. When the church was first built, the blue-grey of the slate formed an ideal contrast for the rich, warm tones of rough field stone walls; now that these are practically lost in ivy, the blue-grey slate forms a perfect complement for the bank of natural green leaves. See Pennsylvania Slate Institute (P. S. I.) Specification 32-B, page 30.

WITH the desire for beauty as well as utility in our school buildings has come a return to the peaked roof and an almost invaluable use of slate. With brick or field stone construction, Pennsylvania Blue-Grey Slate supplies a roof of pleasing contrast at a cost little, if any, greater than the ugly flat roof. As it requires practically no up-keep in the end is much cheaper. See Pennsylvania Slate Institute (P.S.I.) Specifications 11-A, 11-B, or 31-A, pages 26 and 29.

THE use of Pennsylvania Blue Grey Slate of rugged texture adds interest to the pleasing lines of this interesting English type of home. See Pennsylvania Slate Institute (P. S. I.) Specification 31-B-I, page 29. Brick and slate, a permanent house with a permanent roof—age will only enhance its value.

THE bell house of the old Moravian Women Seminary at Bethlehem. The building, which dates back to Revolutionary days, is roofed with Pennsylvania Blue Grey Slate.

Traditional for many centuries for the Tudor English house is a roof of Blue Grey Slate. The colorful field stone in the walls of this splendid Tudor home gain in beauty by the contrasting strength of the Pennsylvania Blue-Grey Slate roof.
See P. S. I. Specification 31-B-1, page 29.

THE HUMAN SIDE OF SLATE MAKING

IN most modern industries a job is a job, a means to a livelihood, to be done and over with, with as little trouble as possible.

You shall be judge of whether this is true of slate.

For instance, in a slate quarry what is known as a "bed" is the compact mass of silica rock between two narrow carbon strips or "ribbons." These beds may be many feet wide or only a few inches. Yet, each bed is known to the quarry workers, not by an impersonal number, but by a personal name—a name given it by the workers themselves from some insignificant incident.

One of the finest beds in Pennsylvania quarries is known as the "Julie Evans."*—Why?

Because when the bed was first uncovered, one of the workmen had a sweetheart by that name, a fine, big, strapping woman but a little wild. That bed of slate, too, was a fine, big, strapping bed, but when the splitter came to split it, he found the cleavage a little "wild," that is, hard to keep straight. That was enough. "Julie Evans" that bed has been ever since, even though years ago its cleavage lost its "Wild ways."

"HOLIBOB"

TAKE another example—a block of slate which contains good material, but because of ribbons or "hard end" will prove difficult to work economically is known as a "Holibob." Where did it get that odd name?

The slate workers in this country are largely English descent and in England it is customary for the father to take his son to the quarry to learn the trade. The boy is supposed to make himself generally useful, and in return is given the odds and ends of slate blocks not worth an experienced man's time. The roofing slate the boy works out of those blocks represents his spending money, pin money for his holiday. You need only to recall that in England "bob" is the slang for "Shilling" to complete the story. "Holiday bob" spending money for the holiday, contracted in true English fashion to "Holibob."

Boys in this country don't go to quarry, they go to school and high school. But the name sticks and hard-to-work blocks come up out of the quarries marked "Holibob."

*NOTE.—This is not the true name, for although the bed was named many years ago, it seems hardly right to use the correct name here. The facts are otherwise exact.

Pennsylvania slate is a natural product with that touch of irregularity which is the distinguishing charm of all hand craftsmanship and the despair of machine reproduction.

THE PRACTICAL REASONS FOR ROOFING WITH SLATE

IF you will make a list of the qualities required for an ideal roof, you will find you have written a description of slate shingles.

First of all, Slate is fire-proof. Sparks from your chimney, burning brands from some blazing buildings have no more effect upon a slate roof than upon the rock of ages, because slate itself is natural rock.

You hear a good deal about "fire-resisting" roofings. If you hold a match under the corner of most of them you will find that a single match is sufficient to ignite them. A roof is either fire-proof or it isn't: there is no middle ground. The only roof fit to protect your home and family is one which is truly fire-proof.

The second important quality of slate is that it is almost totally non-absorbent. The slate produced by the quarries associated in the Pennsylvania Slate Institute is guaranteed to absorb less than half of one per cent. of water in 48 hours' complete immersion. Artificial roofings absorb 20 to 100 times as much.

You will readily see what that means in keeping your house free from dampness. But, have you considered what it means for the life of your roof? Water in combination with heat or frost is the great destroyer of roofing materials. Slate absorbs only one-twentieth to one-hundredth as much water as any other roofing!

The third feature of slate is that it requires no upkeep. It needs no painting or staining and practically no repairing. The first cost is the last cost.

Finally, slate is the permanent roofing. In the vernacular of the day, a roof "takes an awful beating from Old Man Weather." Driving storm, blistering sun, zero cold spend their destructive forces more against the roof than any other part of the building. Yet a roof of Pennsylvania Slate Institute Standard roofing slate defies the weather's worst efforts for half a century and more. *Your motor car, your floor coverings, your home furnishings, any of which cost more than your roof, will be replaced time and time again while your roof of Pennsylvania Blue-Grey slate still guards your home against the worst weather can do and increases in beauty with the years.*

The effect of too much color in a building is as disquieting as too much pastry with a dinner—and, more lasting.

WHAT IS THE PENNSYLVANIA SLATE INSTITUTE

THE Pennsylvania Slate Institute is an association of nine big Pennsylvania producers, operating some twenty-three quarries, banded together to promote a better understanding of slate, and to set and maintain proper standards of roofing slate quality backed by a Certificate-Guarantee.

The quarries represented by this Institute produce two-thirds of the roofing slate produced in this State and probably close to half of the total produced in the United States.

Many of these quarries have been owned and operated by the same families for three or four generations, and have a history of satisfactory service dating back before the Civil War.

The slate of these quarries runs to the cool colors, the blues, greys and blue-greys, usually known as the "Sky-blend" color.

The Pennsylvania Slate Institute seeks to be of service to Architect, Builder, Roofer and all others interested in slate roofing and is glad to answer queries regarding Slate standards, roof types, laying specifications, etc. If you have a roofing problem, put it up to the Institute to help solve it.

An Industry Which Succeeds in Spite of Itself

THE slate industry has practically never advertised. Here and there an individual quarry or selling agency has used some little spasmodic publicity, but in the main, slate has been sold because the public bought it and not because the producers sold it.

We make this statement not boastfully, but apologetically. This is a fast moving age. New materials, good and bad, are daily being produced. And having been produced are sold, often for their enduring qualities—before any one has had the opportunity to learn what those enduring qualities are!

Under such conditions, the producers of fine materials who fail to keep the public posted as to the merit of their goods must accept part of the responsibility for the sales of less satisfactory products. If you have had a trying and costly experience with some synthetic, artificial roofing, perhaps the slate industry owes you an apology.

The world has just been going through a "wave of color" such as follows every great war. Signs are not wanting that the wave is receding: the pity is that it couldn't have receded in time to spare us some of the monstrosities of artificially colored roof which blot the landscape.

When dyes and artificial colorings fade, they become shabby; with Pennsylvania slate, as with other natural products, aging is a beautifying process.

The selection of the right roof for your home isn't the mystery we are sometimes asked to believe.

From a practical standpoint, there are just three requirements: First, the roof must be fire proof; second, it must be waterproof, both in the sense of keeping the water out of the building and of being a non-absorbent material; third, it must be long lived.

From the standpoint of beauty, there are two factors to be considered; that the roof shall be in harmony with the building, and that it shall blend with its surroundings, its setting. The type of the architecture of a building largely determines the type of roof required; the material of which the building is constructed suggest the correct color for the roof.

Architecture, from a roofing standpoint, divides roughly into two classes: the architecture of which formal dignity is the key note, as exemplified in Early American and the various Colonial types, and that in which rugged informality, as exemplified in the English and Normandy Cottage types, is the distinctive characteristic.

The formal Architecture naturally demands formal roof lines, Slate in standard lay in either regular or random widths is a delightful complement to the Architecture. If the construction of the building suggests the need of a heavy roof, thick slate may be used or the heavy effect gained by having the slate offset dressed.

The standard lay can be, and indeed often is, also used for the informal types of Architectures but where it is desirable to carry the spirit of the building into the roof textural, graduated, or thatched lays of slate add a final touch to the charm of the building.

In determining the color of the roof there are two factors to consider; the material of which it is built, and the setting in which it is placed.

If the building is of brick, field stone, or other material rich in the "warm" colors of the spectrum, or if it is to be white or buff stucco limestone, or paint, it needs the strong "cool" blues and greys in the roof for proper contrast.

As for the setting of the building, the chief consideration is for roof colorings that will blend with the blues and greens of sky and grass, for no one wants a house to stick out of the landscape "like a sore thumb."

Finally remember that while your clothes can be changed daily your roof will last, or should, for fifty years. Choose coloring that will never grow tiresome.

Slate has a higher modulus of rupture and a lower capacity for absorbing moisture than any other roofing material.

RIGHT AND WRONG ROOFING METHODS

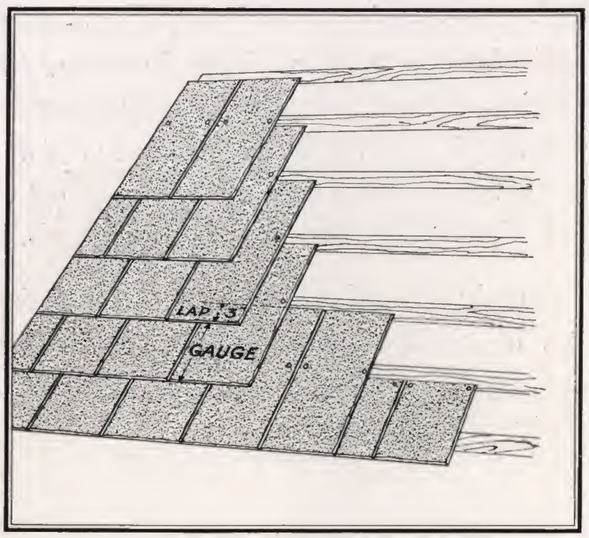
BASICALLY all peaked roofs are made by lapping shingles of some material, one over the other.

If a roof were only called on to shed water poured on from the peak, comparatively narrow laps would turn the water.

But roofs must stand much harder tests. Driving rains fall, not straight down, but at sharp angles and with a force of wind back of them that drives the water back as surely as damming a stream causes it to overflow its banks.

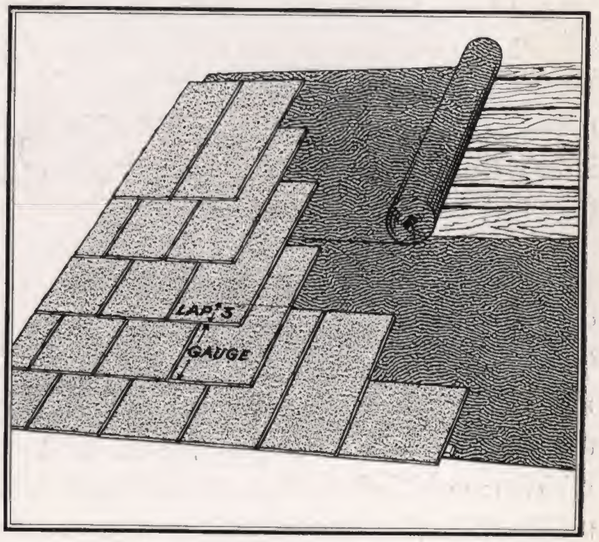
Therefore put down that a proper lap is the basic requirements for a permanently weatherproof roof.

Originally there was only one basic method of laying a roof, that known as the American Method. But recently two other methods have sprung up, the hexagonal and the horizontal. These two later methods are both aimed at producing a cheaper roof, by reducing the amount of the lap of one shingle over another. All these methods will be illustrated and briefly described.



American method on battons—double protection throughout (See text)

But, first let us make one thing clear—*slate can be laid by the hexagonal or the horizontal* method just as readily as any other material. You have never seen slate recommended for such lays, because slate producers with ten centuries of Slate Roof practice behind them know what artificial roofing manufacturers are just learning—*that is, that a roof of single-lapped shingles can only be water tight for as long a time as it takes the weather to rot the "felt" (tar paper) on which the roof is laid.*



American method on board deck—double protection throughout (See text)

And here is the big point. Decide what method of roofing you are willing to have on your house, and then compare the cost of all materials on the *same basis.*

Do we make that clear?

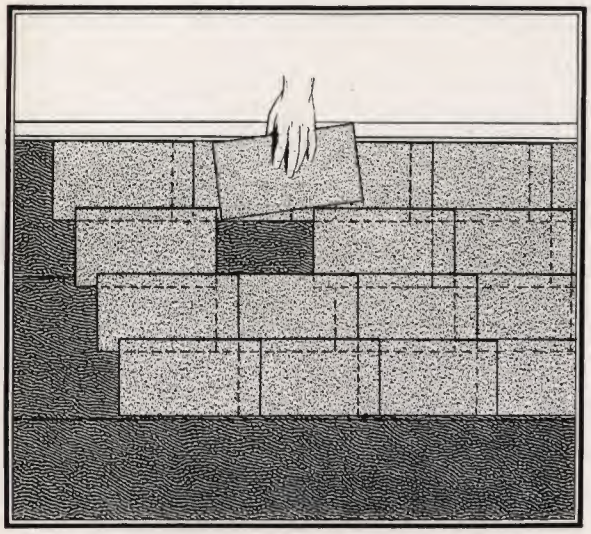
Let us say it another way. Don't compare the cost of slate laid in the American Method and weatherproof for half a cen-

Offset dressing gives the effect of heavy, over-thick slate without the handicap of unnecessary weight and cost.

tury with the cost of some artificial roofing laid with a diagonal or hexagonal method and weatherproof only for the life of the felt (tar paper) deck.

Now, for a brief description of the three methods.

The American method of laying slate starts with a canting strip or slate moulding, to give the slate a slight tilt and make it

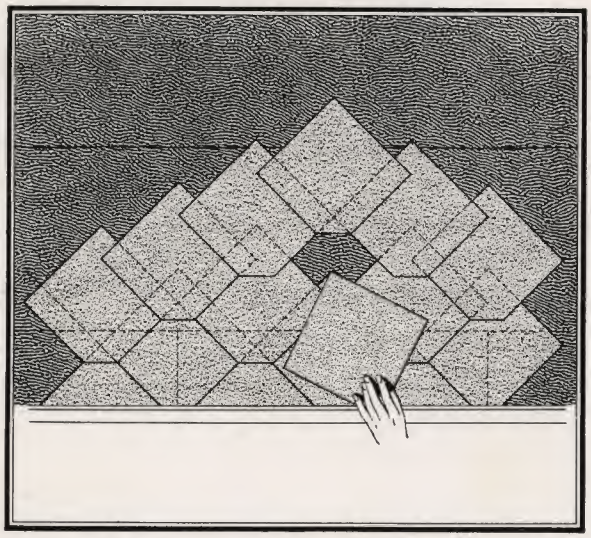


Horizontal Method—the removal of a single shingle exposes the felt paper (See text)

lay tight. Next, a starter course laid horizontal to take care of the joints in the first course proper. These are both more in the way of technical niceties of preparation than of roofing proper.

Now, we begin with the roofing proper. The first course is laid. Then the second is laid so that it laps the first by *half* the length of its slate *plus* $1\frac{1}{2}$ *inches*. The third course lap the second in the same way, and because of that extra three inches, it also laps the first course as you will see by examining the diagram on paper.

In other words, a roof laid in the American Method is covered *everywhere* with two thicknesses of slate shingles and along all upper butts with *three thicknesses*.



Hexagonal Method—the removal of a single shingle exposes the felt paper (See text)

It is customary in this country because of our sifting, driving snow storms to lay slate on a board deck covered with a 15 lb. felt (tar paper) to make it wind-proof.

In England, however, where snows are uncommon, slate is laid on stringers or battons with no board deck or felt below it (see diagram).

Indeed, there are thousands of houses in this country roofed in the same manner. And, for barns where a certain amount of ventilation is desirable or for sections of the country where snow is not a problem there can be no better roof.

But, do you think for a minute that any builder would dare to lay a hexagonal or horizontal roof on battons? The first storm would literally wash out the house.

Of the Hexagonal and Horizontal methods of roofing, little need be said. The diagrams on this page will tell the story.

Moreover notice this fact. A single broken or misplaced shingle in a roof of either of these lays leaves an actual hole in the roof directly exposing the felt (tar paper) deck.

The way to figure the cost of a roof is to divide first cost by years of weather-proof service—on this basis there is no second to Pennsylvania Blue-Grey Slate.

SPECIMEN SAMPLE ROOF OF PENNA. SLATE

PENNSYLVANIA VARITONE SLATE

Pennsylvania Slate Institute Specification 11-A

Pennsylvania Varitone slate roof (see inside back cover) offset dressed, uniform widths, standard lay. The P. S. I. Specification Number covers type and quality of slate and type of dressing and lay.

PENNSYLVANIA VARITONE SLATE

Pennsylvania Slate Institute Specification 11-B

Pennsylvania Varitone slate roof (see inside back cover) offset dressed, random widths, standard lay. The P. S. I. Specification Number covers the type and quality of slate and the type of dressing and lay.

PENNSYLVANIA VARITONE SLATE

Pennsylvania Slate Institute Specification 11-D

Pennsylvania Varitone slate roof (see inside back cover) offset dressed, Westminster thatch lay. The P. S. I. Specification Number covers the type and quality of slate and the type of dressing and lay. For same in Blue Grey instead of Varitone slate use P. S. I. Specification No. 31-D.

PENNSYLVANIA VARITONE SLATE

Pennsylvania Slate Institute Specification 12-A

Pennsylvania Varitone slate roof (see inside back cover) butt cut, dressed, uniform width, standard lay. The P. S. I. Specification Number covers the type and quality of slate and the type of dressing and lay.

For same in random instead of uniform widths use P. S. I. Specification No. 12-B.

Pennsylvania Colortone Slate

Pennsylvania Slate Institute Specification No. 21-A

Pennsylvania Colortone slate roof (see inside back cover) offset dressed, uniform widths, standard lay. The P. S. I. Specification Number covers the type and quality of slate, and the type of dressing and lay.

· For same roof in random widths, use P. S. I. Specification No. 21-B.

Pennsylvania Colortone Slate

Pennsylvania Slate Institute Specification 22-A

Pennsylvania Colortone slate roof (see inside back cover) butt cut dressed, uniform widths, standard lay. The P. S. I. Specification Number covers the type and quality of slate and the type of dressing and lay.

For the same roof in random widths, use P. S. I. Specification No. 22-B.

Pennsylvania Blue Grey Slate

Pennsylvania Slate Institute Specification 31-A

Pennsylvania Blue-Grey slate roof offset dressed, uniform widths, standard lay.

The P. S. I. Specification Number covers either Pennsylvania Gothic Blue Grey, or Storm Blue-Grey slate in smooth texture; also type of dressing and lay.

Pennsylvania Blue Grey Slate

Pennsylvania Slate Institute Specification Number 31-B-I

Pennsylvania Blue Grey Slate roof offset dressed, random widths, standard lay.

The P. S. I. Specification Number covers either Pennsylvania Gothic Blue Grey or Storm Blue Grey in rugged texture; also type of dressing and lay.

Pennsylvania Blue Grey Slate

Pennsylvania Slate Institute Specification 31-B

Pennsylvania Blue-Grey slate roof (see inside back cover) offset dressed random width, standard lay.

The P. S. I. Specification number covers either Pennsylvania Gothic Blue-Grey or Storm Blue-Grey slate in smooth texture. If rugged texture is desired, it must be directly specified.

Pennsylvania Blue Grey Slate

Pennsylvania Slate Institute Specification 32-B

Pennsylvania Blue-Grey slate roof (see inside back cover) butt cut dressed, random width, standard lay.

The P. S. I. Specification number covers either Pennsylvania Gothic Blue-Grey or Storm Blue-Grey slate in smooth texture If rugged texture is desired, it must be directly specified. For the same roof in uniform widths instead of random widths, use P. S. I. Specification No. 32-A.

Pennsylvania Blue Grey Slate

Pennsylvania Slate Institute Specification 32-C

Pennsylvania Blue-Grey slate roof (see inside back cover)—butt cut dressed, Westminster thatched lay. The P. S. I. Specification number covers either Pennsylvania Gothic Blue-Grey or Storm Blue-Grey Slate smooth texture. If rough texture is desired, it must be directly specified.

The same roof with slate offset dressed instead of butt cut, use P. S. I. Specification No. 31-C.

Pennsylvania Blue Grey Slate

Pennsylvania Slate Institute Specification No. 33-A

Pennsylvania Blue-Grey slate roof (see inside of back cover) with natural butts, thatched effect. The P. S. I. Specification number covers either Pennsylvania Gothic Blue-Grey or Storm Blue-Grey slate smooth texture. If rough texture is desired, it must be directly specified.

HOW TO SPECIFY ROOFING SLATE

FOR the convenience of the users of roofing slate the Pennsylvania Slate Institute has prepared a series of specifications so simple that any roofers can lay them.

Look through pages 26 to 31 of this booklet; select the type of roof that suits the building you are planning, write us the specification number shown under the illustration and we will send you a simple, complete and practical specification for the making of that roof.

If you prefer to write your own specification there are seven factors to be considered:

THE TYPE ROOF

(1) Standard Slate Roof
(2) Textural Slate Roof
(3) Graduated Slate Roof
(4) Flat Slate Roof

The Standard slate roof is made of slate uniform in length and thickness, with square tails or butts laid in even lines. It may be uniform or random in width. (Bottom of page 30 shows one example of the standard slate roof.)

The Textural slate roof is more rugged and irregular in character. The tails or butts are either not square or are laid in irregular lines (Page 27 shows one example of a Textural slate roof.)

The Graduated slate roof is one in which slate of graduated thickness is used. In specifying a Graduated roof care must be taken to specify the *exact number of courses* of *each thickness* required.

Flat slate roofs are not discussed in this booklet since they are little used except for office buildings. Proper specification for laying flat slate roofs will, however, be mailed on application to the Pennsylvania Slate Institute.

The next factor to be decided is

THE METHOD OF LAYING

(1) American Method
(2) Hexagonal Method
(3) Horizontal Method

These three methods are explained and diagramed on pages 24 and 25. While slate can be laid by either method as successfully as can any other material, we recommend only the American method.

With the type of roof and the method of laying decided, the next item to specify is—

THE TYPE OF BUTT TRIM

(1) Offset dressed
(2) Butt Cut dressed
(3) Natural Butts

Offset dressing gives the slate a rough, deep-bevel trim, which gives the effect of heavy over-thick slate without the unnecessary weight or cost. Page 29 shows Offset Dressed slate.)

Butt Cut dressing gives the slate more regular even lines. (Bottom of page 30 shows the Butt Cut dressed slate.)

Natural Butts are very irregular in character because the slate is dressed on only three sides, the tail or butt being left with the natural break of the scuped rock. (Bottom of page 31 shows Natural Butt slate.)

The next item to be specified is—

THE METHOD OF SPACING

(1) Closed Space
(2) Open Space

The usual method of spacing slate is to have the shingles as close to each other as is practically possible (see page 29). But it is occasionally desirable to open the space between the slate slightly for the sake of a more rugged and irregular effect The space between slates however should never be more than half an inch and it is better not to use random widths with an open space lay.

That brings us to the matter of—

STYLE OF LINE ARRANGEMENT

(1) Random
(2) Regular

As a matter of fact this will be taken care of under the heading "Size of Slate." It is well, however, to make separate note of whether the arrangement is the regular, that is, all of the same width (See top of page 26) or random, that is, slate of varying width (See bottom of page 26).

SIZE OF SLATE

(1) Length
(2) Width
(3) Thickness

The question of length and width of slate must be considered together. The best rule is that the width shall be not less than half the length, nor more than three quarters of the length. As to thickness, the standard is 3/16″. The standard slate of this institute is made a little thicker, being of uniform thickness to measure 22″ to 24″ to the hundred slates. This is thick enough for any average house or public building. Where cost is not a factor, however, heavier slate can be specified.

Finally we come to the question of color. The slate of the quarries runs to the cool strong tones of the spectrum, the blues and greys which blend so attractively with the natural coloring of sky and foliage.

STANDARD COLOR NOMENCLATURE

(1) Gothic Blue-Grey—Smooth
(2) Gothic Blue-Grey—Rough
(3) Cathedral Grey
(4) Storm Blue-Grey—Smooth
(5) Storm Blue-Grey—Rugged

SKY COLOR BLENDS

(1) Varitone
(2) Colortone

Types of Pennsylvania Blue-Grey Slate — the Sky Blend Colorings

The Quarries represented in the Pennsylvania Slate Institute produce types and blends of slate as follows:

VARITONE—A new blend of five choice Pennsylvania slates, including Cathedral Grey; Gothic Blue-Grey, smooth texture, and Gothic Blue, rough texture; Storm Blue-Grey, smooth texture, and Storm Blue-Grey, rugged texture. Produces a roof in the cool color tones that merge with the natural colors of the sky.

COLORTONE—A blend of three choice Pennsylvania slates, including Cathedral Grey, Gothic Blue-Grey, smooth texture, and Gothic Blue-Grey, rough texture. Also a sky-color blend.

CATHEDRAL GREY—One of the finest American Slates whose unfading grey color tends slightly toward the olive green tones. Its characteristics are strength, longevity and ability to withstand the attacks of acid fumes, soluble salts, alkalies and soot.

GOTHIC BLUE-GREY, SMOOTH—A durable slate of the color recognized on standard color cards as "Slate Grey." Uniform in color throughout and of a smooth, suede-like surface texture.

GOTHIC BLUE-GREY, ROUGH—The same as Gothic Blue-Grey Smooth, except that its surface has that rough, irregular character desired to harmonize with many types of buildings.

STORM BLUE-GREY, SMOOTH—A virile, long-lived striated slate, storm blue in color, striated with hard veins of slightly deeper color than the body of the slate. Beautifies with age.

STORM BLUE-GREY, RUGGED—Same as Storm Blue-Grey Smooth, except that its surface is more rough and irregular and the strictions may include one or more diagonal silica veins, giving the slate a rugged character in harmony with many architectural requirements.

Index to Pennsylvania Slate Institute Slate Roofing Specifications

P. S. I. Spec. No.	See Page	Type of Slate	Type of Dress	Type of Lay
11-A	26 Top	Pennsylvania Varitone	Offset	American, Uniform
11-B	26 Bottom	Pennsylvania Varitone	Offset	American, Random
11-D	27 Top	Pennsylvania Varitone	Offset	Westminster Thatch
12-A	27 Bottom	Pennsylvania Varitone	Buttcut	American, Uniform
12-B	27 Bottom	Pennsylvania Varitone	Buttcut	American, Random
21-A	28 Top	Pennsylvania Colortone	Offset	American, Uniform
21-B	28 Top	Pennsylvania Colortone	Offset	American, Random
22-A	28 Bottom	Pennsylvania Colortone	Buttcut	American, Uniform
22-B	28 Bottom	Pennsylvania Colortone	Buttcut	American, Random
31-A	29 Top	Pennsylvania Blue-Grey	Offset	American, Uniform
31-B-1	29 Bottom	Pennsylvania Blue-Grey	Offset	American, Random
31-B	30 Top	Pennsylvania Blue-Grey	Offset	American, Random
31-D	27 Top	Pennsylvania Blue-Grey	Offset	Westminster Thatch
32-A	30 Bottom	Pennsylvania Blue-Grey	Buttcut	American, Random
32-B	30 Bottom	Pennsylvania Blue-Grey	Buttcut	American, Uniform
32-C	31 Top	Pennsylvania Blue-Grey	Buttcut	Colonial Thatch
33-A	31 Bottom	Pennsylvania Blue-Grey	Natural Butt	Natural Thatch

Pennsylvania Slate Institute

PEN ARGYL - PENNSYLVANIA

CERTIFICATE GUARANTEE

This Certifies THAT THE SLATE LOADED IN CAR NO.__________ __________

is Pennsylvania______________________________Slate
of the following Pennsylvania Slate Institute standard of quality:
Of a modulus of rupture of over 7.000 pounds per square inch. (A.S.T.M. tentative standard test).
Of a porosity of less than ½ of one per cent (A.S.T.M. tentative standard test).
Free from longitudinal curvature to the extent of less than ¼" variation in 16" slates or ⅜" in 24" slates.
Of a thickness to average 22" to 24" to the hundred slate.

Attested by______________________

Certificate No. __________ Date______________

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